

REMARKS/ARGUMENTS

Status of Application

Claims 1-26 are pending. Claims 1-11 and 22-26 have been rejected for indefiniteness; claims 1, 4, 8, 9, 10, 12, and 26 have been rejected as anticipated by U.S. Patent No. 5,504,402 (Menegoli); and claims 2, 5, 13, 22, 24, and 25 have been rejected for obviousness, either over Menegoli or Menegoli in view of secondary references, namely Suzuki U.S. Published Patent Application No. 2004/0080858 (Suzuki), and Goretski et al. U.S. Patent No. 6,094,020 (Goretski).

Claims 16-21 have been held allowable subject to curing minor informalities; and claims 3, 6, 7, 11, 14, 15, and 21 have been objected to as depending on a rejected base claim, but have been indicated to be allowable if rewritten in independent form.

Applicants gratefully acknowledge the indicated allowability of several of the claims, and respectfully request reconsideration of the indefiniteness and prior art rejections.

The Examiner also objected to a number of informalities in the claims, and objected to the disclosure and the abstract. Applicants have addressed all of these objections.

Amendments to the Specification and Abstract

Applicants have addressed the Examiner's objection to the specification by replacing the word "conventional" in the Brief Description of the Drawings with the compound adjective "prior art."

Applicants have also amended paragraph [0025] by adding the parenthetical "(i.e., prior art)" after the word conventional. Since the word conventional in at least these contexts is used interchangeably with the term "prior art," and such terminology is well known, these amendments do not add new matter.

Applicants have also taken the opportunity change all instances of "said" in the Summary of the Invention to "the" for consistency, and to correct a misspelling in paragraph [0033]. These amendments do not add new matter.

The Examiner objected to the Abstract of the Disclosure as having extra wording below the descriptive portion. Applicants interpret “extra wording” to mean the designation of FIG. 6 as the preferred drawing, and have deleted it.

Claim Informalities

The Examiner objected to Applicants’ use of the established convention of introducing a term that is not a universally known term of art by referring to the term generically followed by the qualifier “, referred to as the _____,” to provide a unique reference. This was done for the “motor supply node” (claims 12, 16, and 26) and the “selective isolation switching element” (claim 26).

Applicants have amended the claims in question as proposed by the Examiner, but wish to stress that these amendments do not in any way change the meaning of the terms in question and do not in any way change the scope of the claims in which they appear. This is a matter of individual style rather than any requirement of patentability. The claims were entirely understandable before the amendments and remain so. In any event, since claim 16 was indicated otherwise allowable, the amendment to claim 16 renders claim 16 allowable.

The objections to the lack of a period in claim 10 and the lack of antecedent basis for the control logic in claim 22 are well taken. Applicants have added a period at the end of claim 10 and removed the “said” before the first occurrence of “control logic.” This latter amendment is consistent with the usage in claim 1 and does not add new matter.

Applicants have also taken the opportunity to amend claim 23 to remove a space before the period. A substantive amendment to claim 23 is discussed below.

The Indefiniteness Rejection

The indefiniteness rejection is based on a perceived contradiction between the circuitry entering a regenerative braking state during normal operation. The Examiner has stated that “If the spindle motor is in a braking state, then the circuit is not operating normally unless normal operation means any operation excluding a malfunction. Please clarify.”

Applicants respectfully direct the Examiner’s attention to the first paragraph in the Summary of the Invention, which reads as follows:

[0005] In short, embodiments of the invention provide a regenerative braking mode that is invoked during normal operation. In this context, *normal operation means that power to the disk drive is within acceptable limits and that further read and/or write operations are contemplated.* (Emphasis added).

This is reiterated in paragraph [0059] as follows:

[0059] FIG. 5 is a block diagram of a system 80 for powering and controlling a disk drive according to an embodiment of the present invention. This embodiment represents an enhancement of the conventional system shown in FIG. 1, and as such corresponding elements are shown with corresponding reference numerals. In short, embodiments of the invention provide a regenerative braking mode that is invoked during normal operation. As mentioned above, in this context, normal operation means that power to the disk drive is within acceptable limits and that further read and/or write operations are contemplated. For example, embodiments of the present invention provide *the ability to increase the drive current to head motor 30 during seek operations by entering the regenerative braking mode.* This mode entails operating spindle motor 20 as a generator, and converting its stored kinetic energy into additional power to drive head motor 30. In some instances, for battery-powered systems, the regenerative braking mode could be used to use the kinetic energy once the disk head has been parked safely, to charge up the battery. (Emphasis added).

Thus, Applicants have indeed defined what is meant by “normal operation” and that the regenerative braking mode is entered into during “normal operation,”

As such, Applicants respectfully submit that there is no inconsistency and hence no indefiniteness. Applicants have elected to define the term and have used it consistently in the description and in the claims. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the indefiniteness rejection.

The Prior Art Rejections

The prior art rejections are all based on U.S. Patent No. 5,504,402 (Menegoli). Menegoli is titled “BEMF Rectification Voltage when Power Supply Energy Fails.” As understood, Menegoli describes stepping up the back EMF where regenerative braking is used to park the disk heads in response to a power failure. The emphasis in Menegoli is regenerative braking in the event of a power failure, but the specification mentions other contexts where regenerative braking for the purpose of parking the disk head is used. For example, at column 2, lines 6-11, it is noted that

Although loss of the power is probably the primary reason for moving the read-write head away from the disk, the procedure is typically also initiated when the disk speed does not remain within

tolerance, positioner error is detected, or write circuit faults that could affect stored data are detected.

Thus Menegoli describes the use of regenerative braking and providing a voltage boost *in response to abnormal conditions*.

As mentioned above in connection with addressing the indefiniteness rejection, Applicants differ from the prior art, exemplified by Menegoli, by invoking a regenerative braking mode during normal operation, i.e., where further read and write operations are contemplated. In fact, the specification describes an example where the regenerative braking mode is used to supply extra drive current to the head motor during seek operations.

There is no disclosure or suggestion of applying the teachings of Menegoli during normal operation. Menegoli is quite explicit that the regenerative braking is only invoked for abnormal conditions. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the prior art rejections.

The Secondary References do not Overcome the Shortcomings of the Primary Reference

The Examiner has cited Suzuki (U.S. Published Patent Application No. 2004/0080858) in connection with the rejection of claim 2, which recites that the control logic, in response to a commanded power-down, enters the regenerative braking mode. Suzuki is, like Menegoli, concerned with retracting the head in the event of a power failure. As such, Suzuki does not overcome the shortcomings of Menegoli.

The Examiner has cited Goretski (U.S. Patent No. 6,094,020) in connection with claims 5 and 13, which recite entering the regenerative braking state for a seek operation. Goretski describes a scheme whereby it is possible to provide a boosted voltage to the head actuator (voice-coil motor or VCM) during a seek operation. As understood, this is accomplished by rectifying an induced voltage in a secondary stator winding 116 to charge a capacitor to 24 volts (the normal VCM drive voltage is 12 volts), and using this stepped up voltage in at least some seek operations. Goretski does not describe or suggest cutting off power to the spindle motor. Thus there does not appear to be a regenerative braking mode in

connection with either charging the capacitor to 24 volts, or discharging the capacitor to drive the VCM.

Substantive Claim Amendments

Applicants have amended dependent claim 3, which formerly depended from claim 1, to include all the limitations of claim 1 verbatim. Therefore, claim 3 is allowable.

Applicants have amended dependent claim 23, which formerly depended from claim 22, to include all the limitations of claim 1. The claim language of claim 22 was changed in very minor ways to improve the readability without changing the scope of the limitations of claim 22. Therefore, claim 23 is allowable.

All Claims Are Allowable

Applicants have made all the formal amendments suggested by the Examiner, and have set forth why the prior art rejections to independent claims 1, 8, 12, and 22 should be withdrawn. The dependent claims are all allowable for one or more of the following reasons:

- they depend from claims that are respectfully submitted to be allowable; and/or
- have been held to recite allowable subject matter.

CONCLUSION

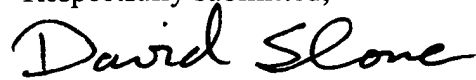
In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

Application No. 10/816,588
Amendment dated April 3, 2006
Reply to Office Action of January 11, 2006

PATENT

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

A handwritten signature in black ink that reads "David Slone". The signature is written in a cursive, flowing style.

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